Fuel Cell Technologies Program Record	
Record #: 11004	**Date:** April 2011
Title: Historical Fuel Cell and Hydrogen Budgets	
Originator: John Garbak, Rick Farmer	
Approved by: Sunita Satyapal	**Date:** July 2011

Item

The Department of Energy has spent over $2 billion (roughly 1% of the total DOE budget) during the last 10 years on fuel cell and hydrogen research, development and demonstration. This is less than 2% of the global investment in the solar, wind and biomass industry in one year alone.

Supporting Information

Program History - From 1990 through 2010, the DOE activities related to hydrogen and fuel cells occurred in several different offices and programs. A summary of the contributing programs is below:

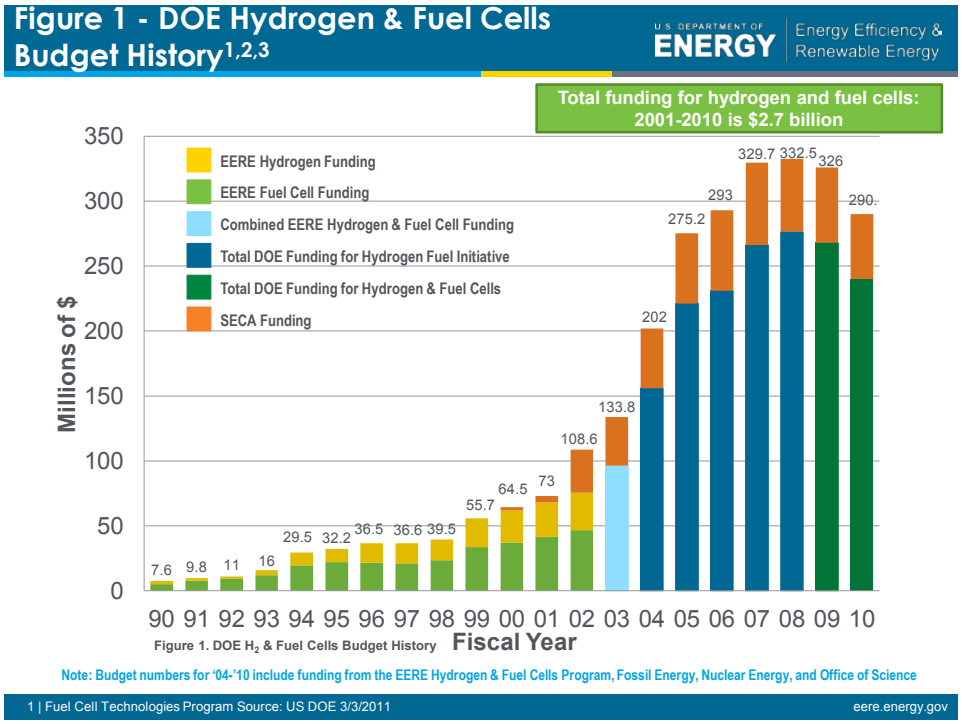
- From 1990 through 2002, the hydrogen and fuel cell programs within the Office of Energy Efficiency and Renewable Energy were two separate programs. The Hydrogen Program was funded from the Energy and Water Appropriations and Fuel Cells from the Interior Appropriation.
- In 2003, the Office of Energy Efficiency and Renewable Energy (EERE) combined the hydrogen and fuel cell programs into one program.
- In 2004, the Hydrogen Fuel Initiative (HFI) began and continued for 5 years, through 2008. The Hydrogen Fuel Initiative combined the DOE efforts of EERE, Fossil Energy (FE), Nuclear Energy (NE) and Basic Energy Science (BES), which is within the Office of Science.
- In FY 2009, hydrogen and fuel cell activities continued in the four DOE offices, as coordinated efforts.
- The Solid State Energy Conversion Alliance (SECA) focused on MW scale solid oxide fuel cells development but was not part of the HFI.

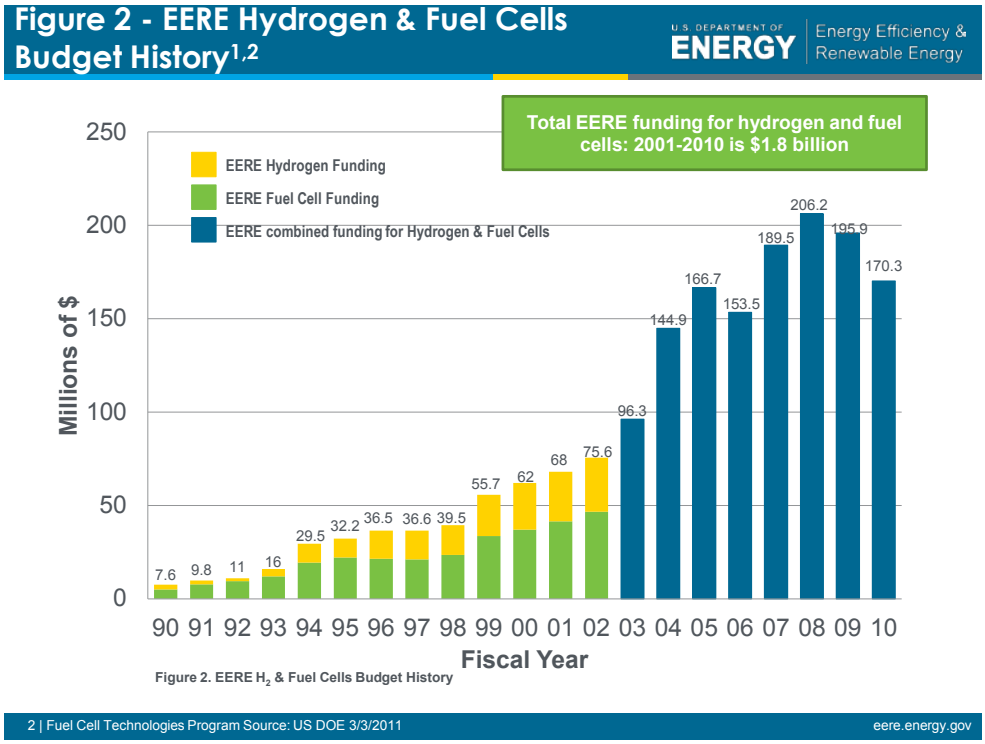
Funding – The charts below summarize the funding for hydrogen and fuel cells since 1990.[1-3] For the years 1990 through 1999, EERE funding is shown. Funding for SECA is shown beginning in 2000. The additional funding provided by FE along with NE and BES is shown beginning in 2004.

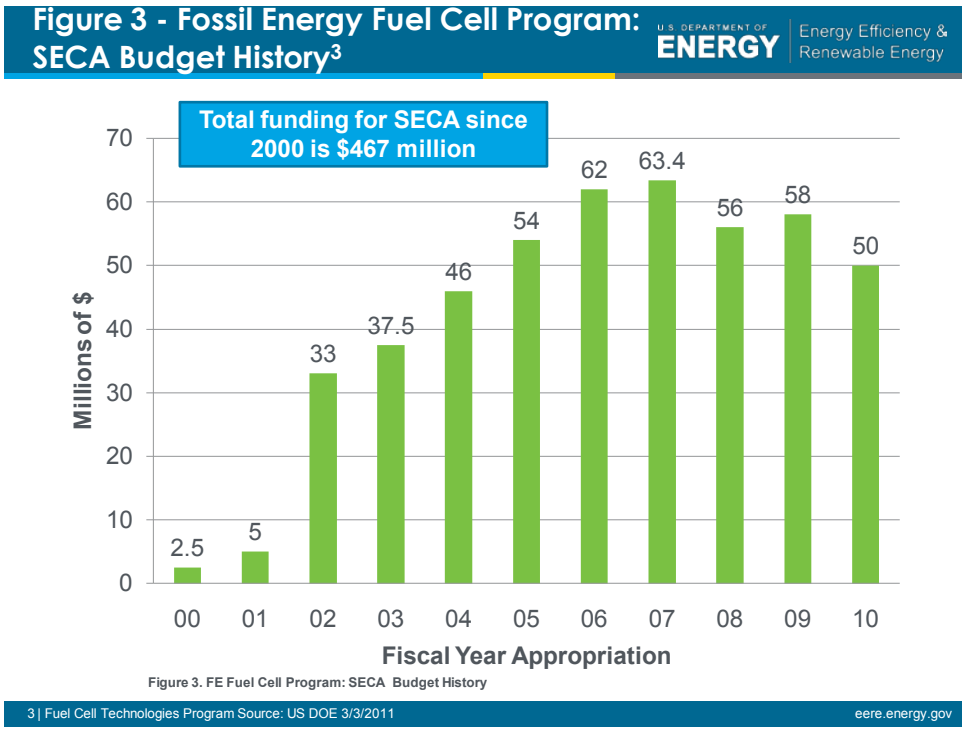
Overall, the funding for hydrogen and fuel cells from these programs exceeds $2.7 billion from 2001 through 2010 (Figure 1). EERE has provided nearly $1.8 billion (Figure 2) while SECA has provided over $460 million during the same time frame (Figure 3). This corresponds to roughly 1.2% of the total DOE budget for the same time period.[4]

In comparison, in 2008 alone, the global investment in solar, wind, and biomass by industry was $155 billion.[5] Over 10 years, DOE spent less than 2% of what was spent in just one year by the solar, wind, and biomass industry. Through DOE-funded efforts, significant progress has been

made, including reducing the cost of fuel cells by more than 80% since 2002, and more than 300 patents and 30 commercial technologies out in the market.[6,7]







References

[1] Dr. JoAnn Milliken, "U.S. Department of Energy Hydrogen Program Annual Merit Review & Peer Evaluation Meeting," Arlington, VA, June 2008, http://hydrogen.energy.gov/pdfs/review08/0_milliken_h2_program_overview.pdf.

[2] "Budget" *Hydrogen Program.* U.S. Department of Energy, Web. May 2011, http://www.hydrogen.energy.gov/budget.html.

[3] Dr. Shailesh D. Vora, "Office of Fossil Energy Fuel Cell Program—Solid State Energy Conversion Alliance (SECA): Clean, Economic Energy for a Carbon Constrained World," National Energy Technology Laboratory, July 2010, www.netl.doe.gov/publications/proceedings/10/seca/Presentations/Vora%20_Presentation.pdf.

[4] http://www.cfo.doe.gov/budget/03budget/content/highlite/highlite.pdf
http://www.cfo.doe.gov/budget/05budget/content/highlite/highlite.pdf
http://www.cfo.doe.gov/budget/06budget/Content/appropsum.pdf
http://www.cfo.doe.gov/budget/07budget/Content/Volumes/Vol_4_SC_DA.pdf
http://www.cfo.doe.gov/budget/BILLREPT/FY08/HEWD/Report_110-185.pdf
http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/hydrogen_fuel%20cells_budget_webinar.pdf

[5] http://www.cleanedge.com/reports/pdf/Trends2009.pdf

[6] http://www.hydrogen.energy.gov/pdfs/10004_fuel_cell_cost.pdf

[7] http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/pathways_2011.pdf